E-rate Deployed Ubiquitously (EDU) 2011 Pilot Program
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Project Abstract:

The Indianapolis Public Schools has implemented a 1:1 student/computer model for all secondary students and a select group of pre-secondary students. This model provides students a Netbook or laptop computing devise and network access 24 hours a day 7 days per week. The total number of students involved in this program exceeds 8,000 urban students, 80% of whom are eligible for the Free and Reduced Lunch Program.

Our 1:1 21st Century Educational Instructional strategy builds on the Problem Based Learning model utilized in earlier building and grade level specific programs such as the Science, Technology, Engineering and Math, the Enhancing Education Through Technology, magnet school programs, and an enhanced New Tech High School model. Our problem based learning strategy incorporates ISTE's NET Standards© for students, teachers and administrators as a framework for guiding our goals, activities and expectations. By providing 1:1 24/7 technology-enriched educational environments, we believe we can close the educational gaps that urban at-risk students exhibit and demonstrate the educational value of broadband access for students.

History

Our first implementation of a problem based Learning model incorporating a 1:1 24/7 mobile computing platform was funded by a five (5) year U. S. Department of Education Challenge Grant from 2001 - 2005. This project, titled the Tech-Know-Build (TKB) project, involved approximately 2,500 students, grades 6 - 8, from 3 middle schools. Students were provided with laptops and with at home cable modem access. Teachers were provided with professional development activities through on-site training and through summer institutes by the district, and in partnership with Indiana University/Purdue University Indianapolis (IUPUI), Purdue University, and the Center for Interactive Learning and Collaboration (CILC).

The TKB project demonstrated while students achieved high-level and more complex problem-solving skills, a fixed home access solution (cable modem) was not practical in an environment with high student mobility. WI-FI and WI-Max are unable to provide the coverage requirements to provide 24/7 access in large urban settings.

Since 2005, the district has implemented STEM (Science, Technology, Engineering and Mathematics) and EETT (Enhancing Education Thru Technology) funded programs utilizing mobile computing platforms and problem based learning strategies. In July 2007, we partnered with the New Technology Network (formally the New Tech Foundation), the Center for Excellence in Leadership of Learning, and the University of Indianapolis to establish a New Tech High concept that was true to the 1:1, 24/7 computer access model. Previous implementations were conceived as

a "fixed desktop for each student on school premises". New Tech High School at the Indianapolis Public Schools has provided each student with a laptop for at school and at home educational use. All teachers and administrators have received problem based learning professional development through CELL and the New Tech Network.

School District and School Building Demographics
Our district is an urban district with an 84% Free and Reduced lunch population (E-rate weighted average of 89%). We project the Free and Reduced population in the 2011 - 2012 Netbook Cellular Broadband to be 84% (E-rate weighted average of 89%). Additional district demographics (based on 2009 - 2010) are:

Demographic:	Value:
Total District Student Population	33,277
Student Profile:	
Black	55%
White	23%
Hispanic	16%
Multiracial	5%
Asian/Native American	1%
Single Parent Household:	
Mother only	63%
Father only	9%
Grandparent	3%
District Mobility Rate	70%
District Attendance Rate	93.5%
Percent Enrolled in Spec. Education	18%
Percent Enrolled in Limited Eng. Prof.	12%

IPS's Netbook Cellular Broadband Project:
Leveraging our New Tech High 1:1 model, in a March 2009 pilot, we deployed 2,750 Netbooks, equipped with cellular data broadband modems, in a 1:1, 24/7 on and off campus network access to secondary students at selected secondary schools. This pilot tested our deployment strategies, imaging, professional development, filtering, and instructional strategies. This pilot was expanded during the current academic year, 2010 - 2011, to include all secondary schools and select pre-secondary schools. The 2011 - 2012 funding year will be the second full year for the 1:1 24/7 Netbook Cellular Broadband Project, although we have had some students involved in true 1:1 24/7 mobile solution since 2001.

Statistically during the 2008 – 2009 and 2009 – 2010 academic years, our New Tech High program, experienced 3% greater attendance and 11% fewer discipline instances than our other high school programs. Graduation rates increased approximately 4% and the percentage of students with end of course assessment

passing scores were approximately 18% higher for the New Tech High program over the same period.

In 2010 - 2011, approximately 8,000 students will be provided Netbooks with cellular broadband capabilities, enabling them 24/7 access to educational resources via the Internet. The Netbooks are utilizing an AT&T cellular broadband connection to access the Internet. Network access on the student Netbooks is routed via VPN back through the district filtering tools and through the district Internet access provider. In addition, if the Netbook connects to the Internet via an alternate connection, such as Wi-Fi or wired, we have them locked to proxy back through the district LAN, achieving similar results.

Before distributing the Netbooks, all schools are required to have a written technology and professional development plan. The professional development must include a minimum of 3 training sessions, with one session prior to distribution. Additionally each school must have an informational meeting to explain with each of the following constituents: teachers; parents; and students. 95% of the parental/student agreement forms are to be signed and returned prior to distribution.

The cellular data contract price is $42.99 per cellular card. In 2009 – 2010 2,750 Netbooks were purchased for $327,600 and an additional 8,000 were purchased in 2010 – 2011 for $1,154,800. The budget for the 1:1 Netbook project is:

	Netbook	Total Priority 1: Cellular Connectivity	Non-Eligible	Disc. Share 88%	E-rate Funding Comm.	Grant Request
2010 – 2011	$327,600	$387,667.50	NA			
2010 - 2011	$1,154,800	$4,662,722.88	$483,152.64	$559,526.75	$4,103,196.13	
2011 - 2012	$400,000	$6,052,265.01	$2,420,906.00	$435,763.08	$3,195,595.93	$2,130,397.28 (N-E * 88%)

The difference non-eligible cost anticipates a higher off-campus use of the Netbooks. District curriculum and technology staff provides Professional Development; the estimated costs are $638,400.00 annually (8hrs X 2280 teachers X $35.00/HR, including training staff costs).

Individual Schools in the Current Netbook Cellular Broadband Project:

BEN	School Name	Location	Type	Urban/Rural	Free and Reduced %	Total Num. of Students	Grade Levels	Total Num. of Teachers
130274	Indianapolis Public Schools, Board of School Commissioners, Indianapolis, IN (District)	120 E. Walnut, Indianapolis, IN 46204	Public	Urban				
51576	Arlington Community High School	4825 N. Arlington Ave., Indianapolis, IN 46226	Public	Urban	89%	1,034	7 - 12	87
51411	Arsenal Technical High School	1500 E. Michigan St., Indianapolis, IN 46201	Public	Urban	86%	2,105	9 - 12	138
51515	Broad Ripple Community High School	1115 Broad Ripple Ave., Indianapolis, IN 46220	Public	Urban	84%	1,047	7 - 12	128
51425	Crispus Attucks Medical Magnet High School	1140 Dr. Martin Luther King, Jr. St., Indianapolis, IN 46202	Public	Urban	77%	814	6 - 12	34

51448	Donnan Middle School	1202 E. Troy, Indianapolis, IN 46203	Public	Urban	88%	618	9 - 12	41
51567	Emmerich Manual High School	2405 Madison Ave., Indianapolis, IN 46225	Public	Urban	87%	746	9 -12	84
210430	George Washington Community High School	2215 West Washington St., Indianapolis, IN 46222	Public	Urban	79%	676	7- 12	55
51408	Harshman Middle School	1501 E. 10th Street, Indianapolis, IN 46201	Public	Urban	90%	373	6 - 12	28
51625	John Marshall Community High School	10101 E. 38th St. Indianapolis, IN 46236	Public	Urban	78%	579	7 - 10	26
51531	Key Learning Community (River)	777 S. White River Pkwy. W. Dr., Indianapolis, IN 46221	Public	Urban	73%	488	9 - 12	12
51553	Northwest High School	5525 W. 34th St., Indianapolis,	Public	Urban	84%	796	9 - 12	41

		IN 46224						
210429	Thomas Carr Howe Academy	4900 Julian Ave., Indianapolis, IN 46201	Public	Urban	88%	1,054	7 - 12	99
51551	William J. Gambold	3725 Kiel Ave., Indianapolis, IN 46224	Public	Urban	87%	574	7 - 8	48
51468	Shortridge Magnet High School Law and Public Policy	3401 N. Meridian St., Indianapolis, IN 46208	Public	Urban	86%	546	6 - 12	41
51522	Merle Sidener Gifted Academy	2424 Kessler Blvd., E. Dr., Indianapolis, IN 46220	Public	Urban	66%	259	2 - 7	17

Indianapolis Public Schools

1:1 Computing

Just as technology is at the core of virtually every aspect of our daily lives and work, we must leverage it to provide engaging and powerful learning experiences, content, and resources and assessments that measure student achievement in more complete, authentic, and meaningful ways. Technology-based learning and assessment systems will be pivotal in improving student learning and generating data that can be used to continuously improve the education system at all levels. Technology will help us execute collaborative teaching strategies combined with professional learning that better prepare and enhance educators' competencies and expertise over the course of their careers. (National Educational Technology Plan 2010)

Introduction

Dramatic change is taking place in the educational landscape of the Indianapolis Public Schools; a transformation unimagined even five years ago and unparalleled in our district's history. We are faced with a new excitement in the vast possibilities of the digital age, for changing how we teach, how various segments of our educational system fit together, and especially how students learn.

The new digital marketplace, the rapid development of virtual schools, and the enthusiasm of an amazing generation of students weaned on the marvels of technology are literally forcing our schools to adapt and change.

Professional educators throughout IPS are slowly beginning to understand that technical innovations such as the Internet and Netbooks are tools for improving learning. As a result, they are beginning to successfully adapt the endless opportunities presented by computer technology, and they are beginning to understand the creative and challenging ways of the high-level technical capabilities and motivation of their students.

The National Education Technology Plan predicts students and teachers will become partners in the exploration of this new universe. Five years from now we

could be looking at the greatest leap forward in achievement in the history of education. By any measure, the improvements will be dramatic.

A Comparison of Traditional and New Learning Environments

Traditional Learning Environments	***New Learning Environments***
Teacher-centered instruction	Student-centered learning
Single-sense stimulation	Multi-sensory stimulation
Single-path progression	Multi-path progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/inquiry-base learning
Factual, knowledge-based	Critical thinking/informed decision-making
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real world context

Source: International Society for Technology in Education (ISTE) NETS Project, National Educational Technology Standards for Students.

The goal of technology integration within the Indianapolis Public Schools is to use technology seamlessly so that the technology itself becomes a transparent and integral tool to teach core curriculum. When computers and software are used so that students have new methods of learning curriculum, these tools can promote and enhance students' understanding of content in powerful ways. They can find information, collaborate with others, and use images and sound as well as text to communicate what they have learned.

New technologies within our schools will enhance our ability in helping our students create new ideas, make discoveries, prove theories, test their knowledge and realize their dreams like never before.

Goals for IPS 1:1 Program

- To provide technology resources necessary to support integration of technology in the classroom
- To improve equity of access to technology
- To improve the quality of learning
- To institute and support best practice in technology integration
- To improve student learning of content

- To institute formative assessments and differentiated instruction
- To increase performance on standardized tests
- To improve student ability to become lifelong learners
- To prepare students for the global market
- To improve the home-school connection

Technology & Curriculum Integration

To anyone born within the last eighteen years, technologies such as cell phones, laptop PCs, and MP3 players are staples of life. They've never known a world without technology such as video games, email, and instant messaging. News reports and studies confirm that the media habits of today's youngsters are very different from that of their parents and teachers. They've been called digital natives, who automatically accept new technologies as their own, while adults are digital immigrants who have to adapt to new tools and new ways of doing things.

Focus: Improve achievement for all students, bridge the digital divide, and enhance instruction.

According to research, technology enables richer understanding and deeper learning beyond what current methods provide because technology lets students access amazingly precise and detailed data. In order to use technology to transform how students learn, professional educators must know the extent to which the tools and resources can help. Simply integrating technology into existing instructional methods is an exchange of medium, but not an advance in method. For learning to progress, we need to transform the method.

The next level of learning looks completely different . . . *D. Crenshaw*

Adjusting lessons and using this information to fill in the gaps between the students' learning style and performance involves differentiating instruction, which is based on the beliefs that students differ in how they learn, classrooms that are not "one size fits all" are more effective, and students must be able to make meaning from subject matter. A differentiated classroom offers students different ways to learn subject content, make sense of ideas, and demonstrate learning. Using 1:1

computing for this purpose makes it easier for teachers to assemble and assign materials and then assess progress on an individual basis.

Students of today encounter technology wherever they go and the use of technology throughout the curriculum would be attractive and motivational, while supporting effective and efficient means to improve student achievement. The combination of differentiating instruction, problem-based learning and an instructional process rooted in technology will offer students outstanding educational opportunities.

Problem-based Learning

Problem-based learning (PBL) provides a structure for discovery that helps students internalize learning and leads to greater comprehension. Research and teachers' experiences have demonstrated those active instructional techniques like PBL can motivate bored students and raise their understanding and achievement level. The strategies incorporated in PBL help students develop critical thinking and reasoning skills, as well as creativity and independence.

- The subject matter is organized around a problem rather than the subject.
- The problem is connected with the students' world for authentic learning opportunities.
- Students accept responsibility for planning and solving the problem.
- The creation of learning teams facilitates student collaborations.
- Students create a product or performance to demonstrate their learning.

Utilizing the PBL process, problems will be presented to students in much the same way that it is presented in reality. Students will identify the problem that is embedded in the issue, and will work with the problem in a manner that allows them to challenge their ability to reason and apply knowledge. Needed areas of learning will be identified in the process of work with the problem and used as a guide to individualize the study for students. Students will have immediate practice applying the knowledge and skills that they are learning as they work through the

problem toward a solution. Student investigations will always culminate in student projects and presentation of models.

The use of effective technology in the PBL curriculum and process is essential. Students and teachers will need to engage in the teaching and learning process in new ways. The process of instruction cannot be reduced to direct transmission of knowledge. Students will need time to explore, make observations, take wrong turns, test ideas, repeat things, and time to collaborate and construct physical and mathematical models to prove concepts. Students will be provided with Netbook computers for this process. Wireless and Wi-Fi connection will allow students to access the Internet whether in the classroom or at home. According to research, when students have after school access to the Internet, PBL investigations are broadened and students are afforded the time to follow connections through various on-line sites.

There are many instructional based tools available within IPS Online designed to help teachers easily facilitate the student learning experience in the classroom below is a listing of a few:

- Teacher/Student Textbooks
- IPS Training Videos and Tutorials
- World Book Online
- NetTrekker
- Rand McNally: Maps & other geographical reference resources
- Destiny: Links to School Library circulation
- MPEC: Links to library material that may be reviewed by teachers
- DIVA and CCC: Links to automated Video circulation
- Ask Rose: Links to Rose Hulman Math and Science Hotline – homework tutor
- Alice Loaners: Links to classroom book sets available at SCIPS for check out
- IMCPL: Links to Marion County Library
- Inspire Databases: Links to eight library databases sponsored by State Consortium
- Gaggle: Monitored email for secondary students, enabling students to learn and participate in professional and effective communications

Benefits of IPS Online Instructional Materials...

- Engage students through multimedia, interactive and adaptive instructional content.
- Support differentiated or personalized learning for unique student learning styles, pace or needs.
- Keep knowledge current and information accurate.
- Support accountability by integrating assessment and classroom management tools.
- Expedite delivery of and access to information and increase portability.
- Enhance flexibility to meet evolving curriculum needs.

Professional Development

Professional development will be crucial in ensuring that IPS develops an effective 1:1 computing initiative. It will include preparing all professional educators to use technology to support standards-based teaching, student-centered learning, and using more effective strategies to reach today's tech savvy students. The goal of technology integration is to use technology seamlessly so that the technology itself becomes a transparent and integral tool to teach core curriculum.

Focus: Ensure professional development is ongoing, NETS standards-based, and of high quality.

For technology integration to be effective, our professional educators need to learn how to use and integrate it successfully. Professional development will be ongoing process. IPS will provide on-going training throughout the 2010 – 2011 and 2011 – 2012 school years beginning June 7, 2010. Sessions will be held throughout the district.

It is critical to the successful integration of technology in the classroom that all professional educators (administrators and teachers) possess the knowledge and expertise to facilitate using technology. The investment in instructional technology and in administrative systems dictates more advanced skills and greater competencies. IPS will devote a considerable amount of resources to enhance professional growth and training.

Classroom Management

Managing a classroom that has technology requires advance planning. Classrooms with Netbooks require even additional planning because of their mobility. As an outgrowth of professional development, teachers need to plan for change. They can participate in workshops and online courses. They can access online professional development resources. They can observe and talk to teachers who are already using technology in their classrooms. They can join online discussions to gather ideas from teachers outside of their school or district. They can explore answers to questions such as:

- How will Netbooks be used to differentiate instruction?
- How will students engage in research and create presentations and reports?
- How will students effectively work on whole and/or small group lessons?
- How can teachers manage Netbooks in the classroom?

Note: Setting expectations by using guidelines are an important step to management but there are other strategies to consider as well. The purpose of using Netbooks is to improve learning, and teachers can keep students focused and on task.

Student Training

While students today are certainly more technology-savvy than in earlier generations, often they need guidance in using technology for learning. Teachers can begin with skills that support Netbooks use and then the specific technology skills and software to use in the curriculum. In short, it means Netbooks training, basic skills training and software applications and tools training. First, when students receive their Netbooks in the 1:1 programs, they need to know the basics of how to maintain and take care of them. Pilot programs have demonstrated that schools providing students with basic training on how to take care of their devices have fewer problems with breakage. In addition, providing a better understanding of the operating system and file management will give students the foundation in understanding the Netbooks capabilities and in using the Netbooks in a learning environment. Some of the basic skills may appear as follows:

Netbook skills

- Operation of the Netbook
  - Features and functions
  - Operating system
- Care and maintenance of the Netbook
  - Handling
  - Cleaning
  - Battery Charging
- Management of files
  - Gaggle email

IPS 1:1 Benchmark Goals

Goals	Objectives	Representative Measurements and/or Data
Adapt instruction to realize technology benefits	Infuse curriculum instructional methods, content, projects, and lessons with technology throughout daily classroom instruction	▪ Increase in digital content ▪ Increase in teacher-reported change in curriculum, instructional methods, etc. ▪ Increase in observed changes in curriculum methods, etc. ▪ Increase use of IPS Online Instructional resources
Increase student achievement, engagement, and ability to learn	Discover inherent, unique advantages of 1 to 1 learning environment to increase achievement, engagement and ability to learn	▪ Increase in scores on formative assessment and summative assessment ▪ Increase in graduation rates ▪ Increase in attendance ▪ Decrease in discipline issues
Create and support equitable opportunities for student learning through use of technology as extension of classroom	Students will know how to properly use technology as extension of classroom connecting home to school	▪ Increase in students demonstrating competence in using technology as an extension of classroom . . . 24/7 environment ▪ Parent survey ▪ Student survey
Delivery of initial training and continuing professional development via face-to-face, podcast, interactive online modules, and IPS Online	Staff development materials, web sites, self-directed learning (via on-line or blended instruction)	▪ Increase in the number of teachers that progress from their initial state of use of technology in their teaching, and use of IPS On line

2010 - 2011
Indianapolis Public Schools
Netbook, Network, and Internet Use Agreement

The purpose of this agreement is to outline the rules of using Indianapolis Public Schools' computer equipment at school and home. Since students using computers will be using the wireless environment and modem access to connect to the Internet, all parents and students must understand the rules.

**Violation of this Agreement may result in access privileges being revoked, school disciplinary action, and/or legal action.

Students are responsible for appropriate behavior on the school's computer equipment. Communications on the network are often public in nature. General school rules for behavior and communications apply. It is expected that users will comply with the standards and specific rules listed below.

The use of the computer equipment is a privilege, not a right, and may be revoked if abused. The user is personally responsible for his/her actions in accessing and utilizing the school's computer resources. The students are advised never to access, keep, or send anything that they would not want their parents or teachers to see.

PRIVACY – Network and hard drive storage and student email, may be treated like school lockers. Administration may review communications at any time to maintain system integrity.

ILLEGAL COPYING – Students should never download or install any software or games onto the computer without permission from the Computer Specialist.

INAPPROPRIATE MATERIALS OR LANGUAGE – No profane, abusive, or impolite language should be used to communicate. No inappropriate material such as nudity, pornography, etc. should be downloaded to the technology equipment. A good rule to follow is never view, send, or access materials which you would not want your teachers and/or parents to see. Should students encounter such material by accident, they should report it to their teacher immediately who will notify the Computer Specialist.

Note: Cyber Bullying such as personal attacks and/or threats on/against anyone made while using district owned technology to access the Internet or local school networks are to be reported to responsible school personnel.

USER NETWORK AND INTERNET RULES

1. Take care of the computer and the network at all times. You are responsible.

2. The Netbook, network, and Internet is to be used for educational purposes.

3. Abide by the copyright laws. If you didn't purchase the games or songs, they cannot be on the computer.

4. Please respect yourself and others when using technology. Treat others as you want to be treated. Do not use profanity, abusive, or impolite language. Do not trespass in another student's folder, work, or files.

5. Passwords are to be shared with parents, teachers, and the computer specialist. Do not tell other students your password because you are then responsible for their actions in your account.

6. Use Netbook responsibly - do not waste limited resources such as disk space or printing capacity. (This means that the computers are not picture or game galleries.)

7. Do notify an adult immediately, if you encounter any inappropriate materials. Student's responsibility is to tell an adult and do not share with other students.

8. Use of proxy filters or bypassing the IPS filter is prohibited. This includes accessing external Wiki's blogs, chat and emails.

Student Guidelines for Netbook use:

- Do not loan your Netbook or charger and cords.
- Do not leave the Netbook in a vehicle.
- Do not leave your Netbook unattended.
- Do not eat or drink while using the laptop or have food or drinks in close proximity to the Netbook.
- Do not allow pets near your Netbook.
- Do not place the Netbook on floor or in sitting area such as couches or chairs.
- Do not leave the Netbook near table or desk edges.
- Do not stack objects on top of your Netbook.
- Do not leave the Netbook outside or use near water such as a pool.
- Do not check the Netbook as luggage at the airport.
- Students must back up data and other important files regularly. IPS will at times maintenance the laptops by imaging. All files not backed up to server storage space or other storage media will be deleted during these processes.

Students are ultimately responsible for backing up all personal files on their own storage media.

ACKNOWLEDGEMENT

I have read and agree to abide by the provisions of the attached policy regarding the use of IPS Technical Resources systems that have been entrusted for use by me. I understand that IPS reserves the right to examine, inspect and/or monitor my use of IPS' Technical Resources in accordance with the provision of the policy. I acknowledge and agree that electronic files, records, and communications which I create or use are solely IPS property and shall at all times remain subject to access and review in accordance with the terms of this policy. I have no expectation of privacy regarding communications created, received, stored on, or transmitted through IPS' Technical Resources.

I will provide any codes, passwords, encryption information or other means necessary for IPS to access my use of IPS Resources to my supervisor or the Superintendent or the Board President (employees) or to my teacher or the principal (students) upon a request made and approved in accordance with the terms of this policy. (I understand that the Netbook is the property of IPS, and may be collected and/or reviewed at anytime.)

Name of Student_____

Signature of Student_____ Date: _____

Signature of Parent/Guardian_____ Date: _____

Please respond to the following:

_____ Yes, I **have** Internet access at home.

_____ No, I **do not have** Internet access at home.